

WHAT IS CLAIMED IS:

- 1       An output shaft supporting structure for automatic transmission comprising:
- 5       an output shaft whose one end is positioned at an input shaft side and whose the other end is positioned away from the input shaft side and having a hollow space opened in the one end side, the output shaft decelerating or accelerating the rotation of the input shaft in response to the gear ratio corresponding to a speed change stage;
- 10       an intermediate shaft coaxially disposed relative to the input shaft and whose one end is positioned in the input shaft side and whose the other end has an insert portion inserted into the hollow space of the output shaft;
- an extension housing placed on the edge of the other end of the output shaft in a casing covering the main body of the automatic transmission;
- 15       a first bearing disposed between the outer peripheral surface of the output shaft and the inner peripheral surface of the extension housing;
- a second bearing disposed between the inner peripheral surface of the extension housing closer to the other side of the output shaft than the first bearing and the outer peripheral surface of the output shaft;
- a third bearing disposed between the outer peripheral surface of the insert portion and the inner peripheral surface of the hollow space,
- 20       wherein a part of rotational elements of a planetary gear set is supported between the outer peripheral surface of the insert portion closer to one end of the intermediate shaft than the third bearing and the inner peripheral surface of the hollow space, and at least a portion of axial position of the third bearing is

located between the first bearing and the second bearing.

2        An output shaft supporting structure, according to claim 1, wherein an  
external spline engaging with an internal spline formed in the hollow space is  
5        formed in the outer peripheral surface of rotational elements of the planetary  
gear set supported between the outer peripheral surface of the insert portion and  
the inner peripheral surface of the hollow space, and the inner peripheral surface  
of the rotational element of the planetary gear set is relatively and rotatably  
supported relative to the outer peripheral surface of the insert portion.

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3        An out put shaft supporting structure, according to claim 1,  
wherein clearance between the internal spline and the external spline in radial  
direction is formed in the hollow space and the clearance is set to be larger than  
distance in the most inclined position of the intermediate shaft 12 relative to the  
15        center of axis in radial direction.

4        An out put shaft supporting structure, according to claim 2,  
wherein clearance between the internal spline and the external spline in radial  
direction is formed in the hollow space and the clearance is set to be larger than  
20        distance in the most inclined position of the intermediate shaft 12 relative to the  
center of axis in radial direction.

5        An output shaft supporting structure, according to claim 2,  
wherein the rotational element of the planetary gear sets splined with the inner

peripheral surface of the hollow space serves as a carrier, and the intermediate shaft serves as a sun gear engaging with a pinion gear of the planetary gear sets, and the outer peripheral surface of one end side of the output shaft relatively and rotatably supports a ring gear of the planetary gear sets.

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6        An output shaft supporting structure, according claim 3, wherein the rotational element of the planetary gear sets splined with the inner peripheral surface of the hollow space serves as a carrier, and the intermediate shaft serves as a sun gear engaging with a pinion gear of the planetary gear sets, and  
10       the outer peripheral surface of one end side of the output shaft relatively and rotatably supports a ring gear of the planetary gear sets.

7        An output shaft supporting structure, according claim 4, wherein the rotational element of the planetary gear sets splined with the inner peripheral  
15       surface of the hollow space serves as a carrier, and the intermediate shaft serves as a sun gear engaging with a pinion gear of the planetary gear sets, and the outer peripheral surface of one end side of the output shaft relatively and rotatably supports a ring gear of the planetary gear sets.

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